

Quadratic expressions and equation 2 Questions and Answers - Form 3 Topical Mathematics

Questions

1.
 - a. Use a convenient scale to draw the graph of $y = -x^2 + 5x - 3$ for the range $-2 \leq x \leq 6$
 - b. Use your graph to determine the roots of the equation $5x - x^2 - 3 = 0$
 - c. Use your graph to solve the equation $2x - x^2 + 3 = 0$ by drawing a suitable straight line
2. Find a quadratic equation whose roots are $2.5 + \sqrt{3}$ and $2.5 - \sqrt{3}$, expressing it in the form $ax^2 + bx + c = 0$ Where a, b and c are integers.
3.
 - a. Complete the table below for the equation $y = x^2 + 3x - 6$ for $-6 \leq x \leq 4$

x	-6	-5	-4	-3	-2	-1	0	1	2	3	4
y	12			-6			-6				22
 - b. Using a scale 1cm to represent 2 units in both axes. Draw the graph of $y = x^2 + 3x - 6$
 - c. Use your graph to solve:-
 - i. $x^2 + 3x = 6$
 - ii. $x^2 + 3x - 2 = 0$
4.
 - a. Complete the table for the function: $y = 2x^2 + 3x + 1$

x	-4	-3	-2	-1	0	1	2	3
$2x^2$		18			0			18
$3x+1$		-7			0			10
y		10			1	6		
 - b. Use the table in (a) above to draw the graph : $y = 2x^2 + 3x + 1$ for $-4 \leq x \leq 3$
 - c. Use the graph in (b) to solve the equation :-
 - i. $2x^2 + 4x - 3 = 0$
 - ii. $x^2 + \frac{3}{2}x + 2 = 3$
5. A youth group decided to raise Ksh 480,000 to buy a piece of land costing Ksh. 80,000 per hectare. Before the actual payment was made, four of the members pulled out and each of those remaining had to pay an additional Kshs. 20,000.
 - a. If the original number of the group members was x, write down;
 - i. An expression of how much each was to contribute originally.
 - ii. An expression of how the remaining members were to contribute after the four pulled out.
 - b. Determine the number of members who actually contributed towards the purchase of the land.
 - c. Calculate the ratio of the supposed original contribution to the new contribution.
 - d. If the land was sub-divided equally, find the size of land each member got. (2 mk)
6.
 - a. Draw the graph of $y = 2x^2 + x - 2$ given the range $-3 \leq x \leq 2$
 - b. Use your graph above to solve
 - i. $2x^2 + x - 2 = 0$
 - ii. $2x^2 + x - 3 = 0$
 - iii. $2x^2 + x - 5 = 0$
7.
 - a. Use trapezoidal rule to find the area between the curve $y = x^2 + 4x + 4$, the x- axis and the

$bx + c = 0$, where a, b, and c are integers

15. If $a^2 + b^2 = 89$ and $a + b = 13$

- a. Find the values of;
 - i. $a^2 + 2ab + b^2$
 - ii. $2ab$
 - iii. $a^2 - 2ab + b^2$
 - iv. $a - b$
- b. Determine the values of a and b

a. Complete the table below for the function $y = 2x^3 + 5x^2 - x - 6$ (2 mks)

x	-4	-3	-2	-1	0	1	2
$2x^3$	-128	-54			0	2	16
$5x^2$	80	45	20	5	0	5	20
-x	4	3			0	-1	
-6	-6	-6	-6	-6	-6	-6	-6
y	-50				-6	0	

- b. On the grid provided draw the graph $y = 2x^3 + 5x^2 - x - 6$ for $-4 \leq x \leq 2$. Use 2cm to represent 1 unit on the x-axis and 1 cm to represent 5 units on the y - axis (4 mks)
- c. By drawing a suitable line, use the graph in (b) to solve the
 - i. $2x^3 + 5x^2 + x - 4 = 0$
 - ii. $2x^3 + 5x^2 - x + 2 = 0$

Answers

1.

a.

x	-2	-1	0	1	2	3	4	5	6
y	-17	-9	-3	1	3	3	1	-3	-9

- b. $y = 5x - x^2 - 3$
 $0 = 5x - x^2 - 3$
 $y = 0$
 $x = 0.75$ or 4.3 ± 0.1

- c. $y = 5x - x^2 - 3$
 $0 = 2x - x^2 + 3$
 $y = 3x - 6$

$$\begin{array}{l} x \ 0 \ -1 \ 2 \\ y \ -6 \ -9 \ 0 \end{array}$$

$$x = -1 \text{ or } 3 \pm 0.1$$